



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,531	07/15/2003	Doni S. Dattani	03-0444 1496.00308	7492
24319	7590	01/28/2008		
LSI CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			EXAMINER HUBER, JEREMIAH C	
			ART UNIT 2621	PAPER NUMBER
			MAIL DATE 01/28/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/619,531

Applicant(s)

DATTANI ET AL.

Examiner

Jeremiah C. Huber

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months' after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/13/2007 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2 and 5-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun (20030202705) in view of "Working Draft Number 2 Revision 2" (hereafter WD2).

In regard to claim 1 Sun discloses an apparatus including:

a first processing circuit configured to generate a plurality of reconstructed samples in response to one or more macroblocks or an input signal (Sun Fig. 1 note dequantization (Q-1), inverse transform (T-1), adder (+) and frame buffer and par. 12 note reconstruction path).

Art Unit: 2621

a second processing circuit configured to determine an intra prediction predictor for a current macroblock in response to available reconstructed samples adjacent to the current macroblock (Sun Fig 1 note Intra MB section par. 12 intra mode).

It is noted that Sun does not disclose details related to chroma sub-blocks. However WD2 discloses a method of providing a intra prediction DC predictor for each 4x4 chroma sub-block wherein each of the intra DC predictors are generated in response to four adjacent samples when all four adjacent samples are present and predictors are generated in response to two adjacent samples on the same edge when available (WD2 sections 4.4.2-4.4.5 pages 28 to 33 particularly page 33 section 4.4.4.1.3 note S0-S3). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of including chroma sub-block intra prediction as disclosed by WD2 in the apparatus of Sun in order to improve coding efficiency.

It is further noted that neither Sun nor WD2 disclose details relating to circumstances where some adjacent samples are present but not all four, or only two on the same edge. However, after thorough consultation with a supervisor, the examiner believes that the current claim language indicating "and otherwise" is claiming in the alternative. As such, a reference need only meet limitations (i) and (ii) or limitation (iii). In order to clarify the claim the applicant should include some limitation indicating that all conditions (i)-(iii) apply to the sub-block. The further rejection of claim 1 below will treat the claim as if this limitation were included.

In regard to claim 2 refer to the statements made in the rejection of claim 1 above. Sun further discloses that the second processing circuit is implement in the decoding loop of an encoder (Sun Fig. 1 and par. 12note intra MB section is part of the reconstruction, or decoding loop.).

In regard to claim 5 refer to the statements made in the rejection of claim 1 above. WD2 further discloses that intra predicted sub-blocks are generated in response to predictors (WD2 page 33 section 4.4.4.1.3 note S0-S3)

In regard to claim 6 refer to the statements made in the rejection of claim 5 above. WD2 further discloses that the predictors are generated in response to reconstructed samples (WD2 page 33 section 4.4.4.1.3 note S0-S3 are the sums of 4 neighboring pixels).

In regard to claims 7-9 refer to the statements made in the rejection of claim 6 above. WD2 further discloses that reconstructed samples are formed from both a row adjacent to the top edge and a column adjacent to the left edge of the chroma block (WD2 page 33 section 4.4.4.1.3 note figure 8).

In regard to claim 10 refer to the statements made in the rejection of claim 9 above. WD2 further discloses that predictors are the sums of neighboring reconstructed samples (WD2 page 33 section 4.4.4.1.3 note S0-S3 are the sums of 4 neighboring pixels).

In regard to claim 11 refer to the statements made in the rejection of claim 9 above. WD2 further discloses indicating whether a particular sum of reconstructed

samples is available (WD2 page 33 section 4.4.4.1.3 note cases where only two or none of the predictors are available).

In regard to claims 12-14 refer to the statements made in the rejection of claims 1 and 6-11 above. WD2 further discloses that there is only one mode for chroma prediction, which following the WD2 naming convention would be the 0th mode (WD2 page 33 section 4.4.4.1.3 note first sum of neighboring pixels is labeled S0 rather than S1).

In regard to claim 15 refer to the statements made in the rejection of claim 13 above. WD2 further discloses that predictors are selected independently for each sub-block (WD2 page 33 section 4.4.4.1.3 note when all predictors are present sub-blocks A, B, C, and D each receive different values).

In regard to claim 16 refer to the statements made in the rejection of claim 13 above. Sun further discloses inverse quantization and inverse transformation (Sun Fig. 1 note dequantization (Q-1), inverse transform (T-1), adder (+) and frame buffer and par. 12 note reconstruction path).

In regard to claims 17-19 refer to the statements made in the rejection of claim 13 above. WD2 further discloses using a predetermined value of 128, for the predictor when no sums are available (WD2 page 33 section 4.4.4.1.3 note $A=B=C=D=128$ when S0-S3 are outside the frame, also note 128 is the median value of the standard chroma range of 0-255).

In regard to claim 20 refer to the statements made in the rejection of claim 14 above. WD2 further discloses that the best predictor is a weighted average of one or

Art Unit: 2621

more corresponding sums (WD2 page 33 section 4.4.4.1.3 note best predictor occurs when S0-S3 are present, also note A is the weighted average of S0 and S2 with each weight of 1).

2. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun in view of WD2 as applied to claim 1 above, and further in view of Joch et al (20040101059).

Sun further discloses that the encoder conforms to the H.264 standard (Sun Fig. 1 and par. 12). It is noted that neither Sun nor WD2 explicitly disclose details of a decoder. However decoding is substantially the inverse operation of encoding, and at the time of the invention it would have been obvious to one of ordinary skill in the art to arrange the components disclosed by Sun and WD2 in order to implement an H.264 compliant decoder to decode an H.264 compliant bitstream encoded by the encoder of Sun in view of WD2 as is shown by Joch (Joch Fig. 4 and pars. 62-73).

3. Claims 1-2 and 5-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun in view of WD2 and in further view of Sun (20030223495, hereafter Sun2).

In regard to claim 1 Sun discloses an apparatus including:

a first processing circuit configured to generate a plurality of reconstructed samples in response to one or more macroblocks or an input signal (Sun Fig. 1 note dequantization (Q-1), inverse transform (T-1), adder (+) and frame buffer and par. 12 note reconstruction path).

a second processing circuit configured to determine an intra prediction predictor for a current macroblock in response to available reconstructed samples adjacent to the current macroblock (Sun Fig 1 note Intra MB section par. 12 intra mode).

It is noted that Sun does not disclose details related to chroma sub-blocks. However WD2 discloses a method of providing a intra prediction DC predictor for each 4x4 chroma sub-block wherein each of the intra DC predictors are generated in response to four adjacent samples when all four adjacent samples are present and predictors are generated in response to two adjacent samples on the same edge when available (WD2 sections 4.4.2-4.4.5 pages 28 to 33 particularly page 33 section 4.4.4.1.3 note S0-S3). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of including chroma sub-block intra prediction as disclosed by WD2 in the apparatus of Sun in order to improve coding efficiency.

It is further noted that neither Sun nor WD2 disclose details relating to circumstances where some adjacent samples are present but not all four, or only two on the same edge. However, Sun2 discloses a sub-block DC intra prediction method in which for the current sub-block the availability of samples is individually assessed for each adjacent sub-block and the best predictor is determined based on the availability (Sun2 Figs. 1-2 and pars. 27-41, note pars. 27 and 40-41 availability is assessed for adjacent 4x4 sub-blocks unlike the 8x8 assessment in WD2). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of including individual sample availability assessment and best predictor

Art Unit: 2621

determinations as taught by Sun2 in the sub-block prediction method of Sun in view of WD2 in order to exploit spatial redundancies in an image as suggested by Sun2 (Sun2 par. 24).

In regard to claims 2, and 5-20 refer to the statements made in the rejection of claims 2 and 5-20 in section 1 above.

4. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun in view of WD2 and in further view of Sun2 as applied to claim 1 above and Joch.

In regard to claims 3-4 refer to the statements made in the rejection of claim 1 in section 3 above, and claims 3-4 in section 2 above.

Response to Arguments

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremiah C. Huber whose telephone number is (571)272-5248. The examiner can normally be reached on Mon-Fri 8:00 a.m. - 4:30 p.m..

Art Unit: 2621

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571)272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeremiah C Huber
Examiner
Art Unit 2621

Mehrdad Dastouri
MEHRDAD DASTOURI
SUPERVISORY PATENT EXAMINER
TC 2600